

OpenMixer

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OpenMixer

- CCRMA Listening Room Specification
- Motivation
- Technical Requirements
- Hardware
- Software
- How to operate
- Current State and Future works
- Acknowledgements

CCRMA Listening room

- Spherical speaker configuration
- Ring of 8 ear level
- Ring of 4 above
- Ring of 4 below underneath cage



CCRMA Listening room

- Semi anechoic
- Noise floor below 24dB
- 7.036x7.417x 2.184 (L x W x H) in meters
- Metal cage at center in shape of heptagon



Motivation

- Digital Mixer Less than optimal for purposes
 - Designed for Stereo, 5.1, and 7.1 mixdowns
 - No need for compressors, limiters, etc...
 - Gets expensive to expand mixer for multichannel outputs
 - No Preset Management authentication
 - Hierarchical menus get confusing
 - Fans !!!

Requirements

- No options hidden in hierarchical menus
 - All controls directly effect sound diffusion
 - Easy Intuitive controls
- Preset management
 - Use CCRMA authentication system
- Routing and control Matrix
 - Digital, Analog, and network sources
- Handle Multi-channel Ambisonics encoded input streams

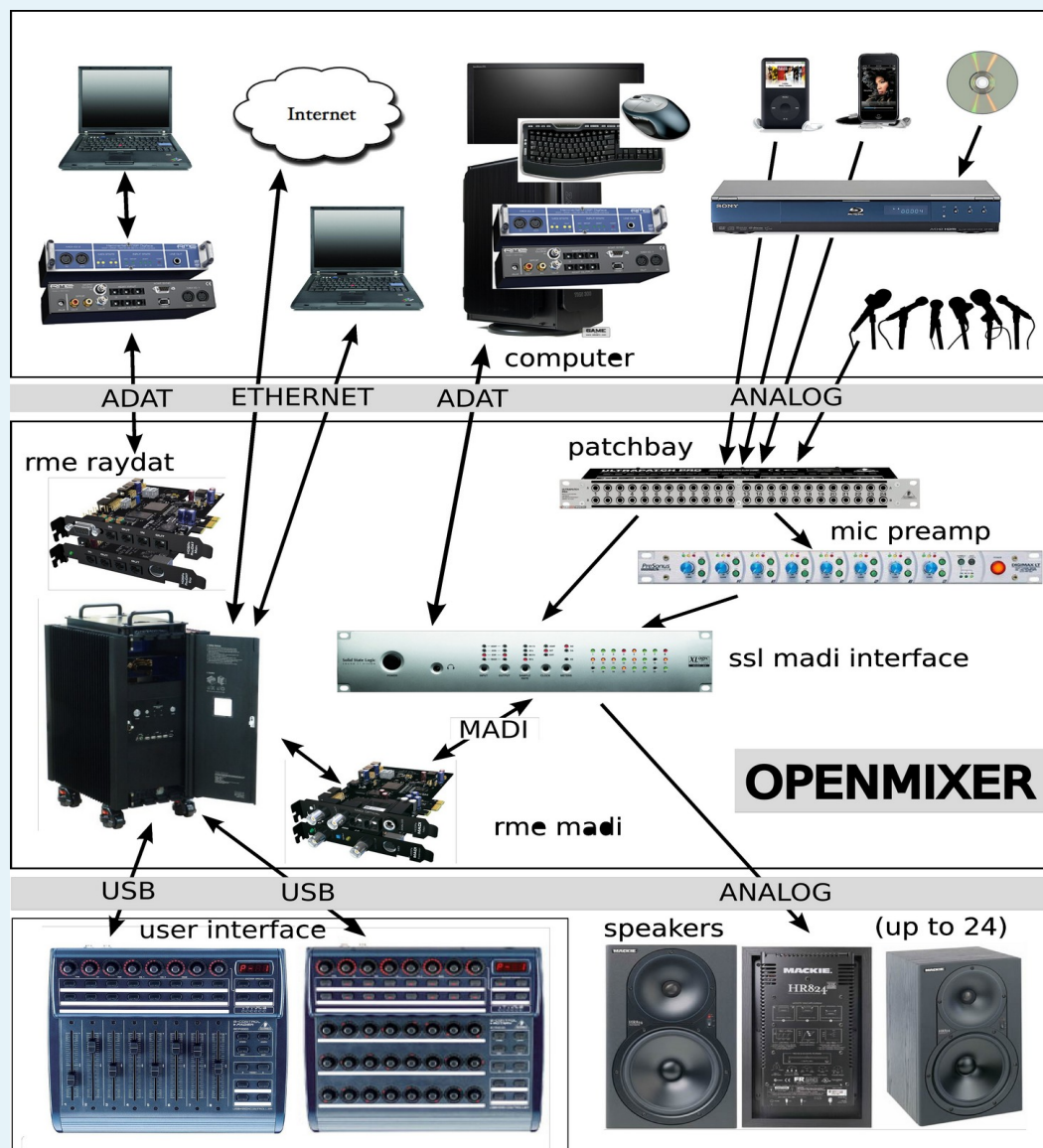
Requirements

- No need for audio processing tools
 - Such as compressors, limiters, eq, etc...
- Stand alone system
 - Boots into custom software w/ feedback
 - Play sources directly(dvd, blueRay, etc...)
- General purpose off-the-shelf components
- OpenSource

I/O Requirements

- 16ch Analog line-level balanced inputs
- 8ch Mic-level input
- 8 ch Analog line-level input for Media player
- 3 ADAT I/O for CCRMA Linux workstation
- 3 ADAT I/O for external computers
- Dedicated Gigabit Ethernet network jacks
 - Running netjack and jacktrip

Hardware



Hardware

- Fanless Dedicated OpenMixer computer
 - RME Raydat and RME Madi card
- SSL Alphalink Madi AX DAC/ADC converter
- Analog, ADAT, and Network patchbay
- Presonus 8ch Mic Preamp
- BCR/BCF 2000 (midi controllers)
- Fanless CCRMA linux workstation
 - RME Digiface 24ch ADAT I/O
- BlueRay/DVD player

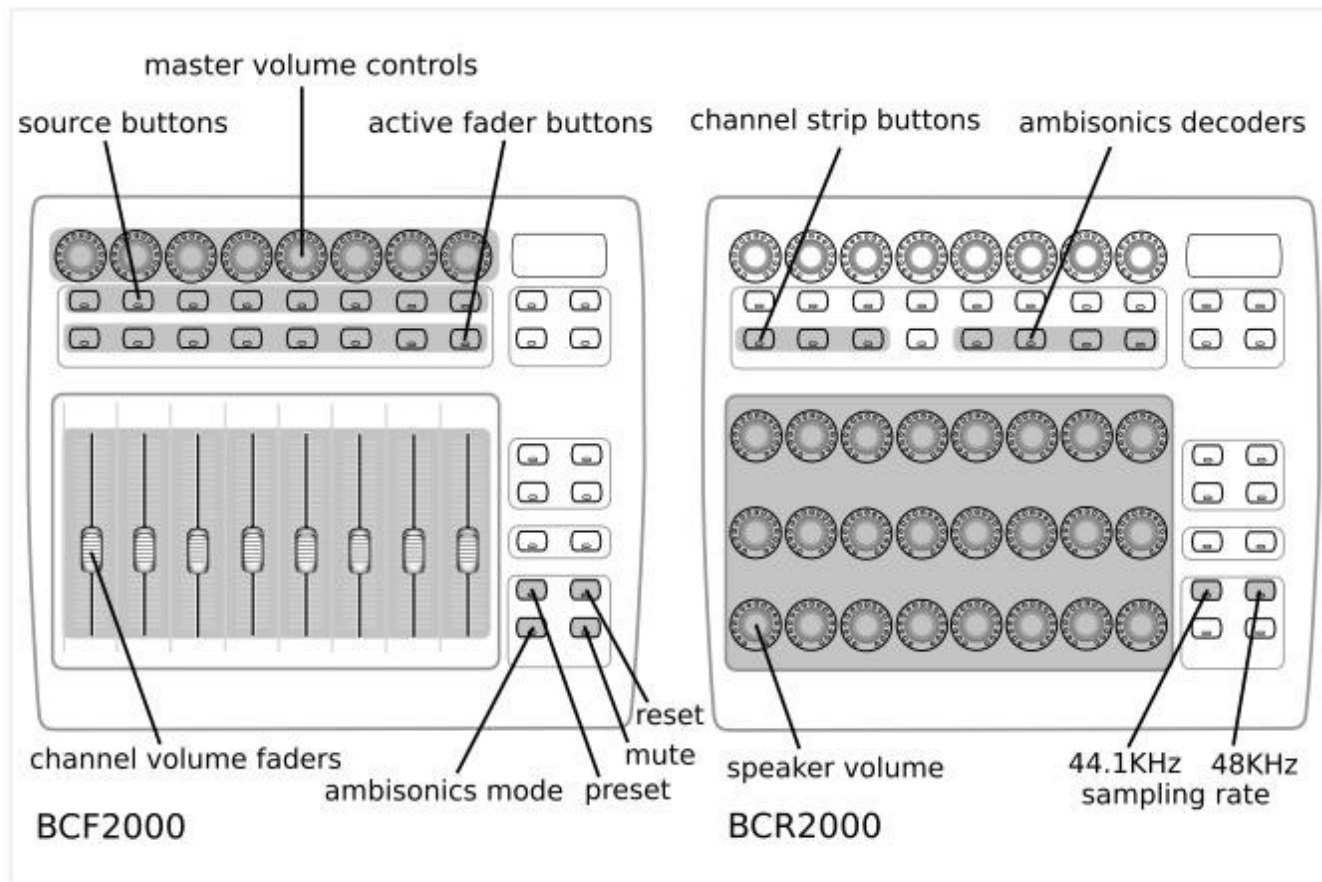
Software

- OpenMixer (written in supercollider)
- jack2
- Jmess
- Jacktrip
- Netjack (netone)
- Jconvolver
- ambdec_cli
- OpenSoundControl

Software

- Midi
- Perl

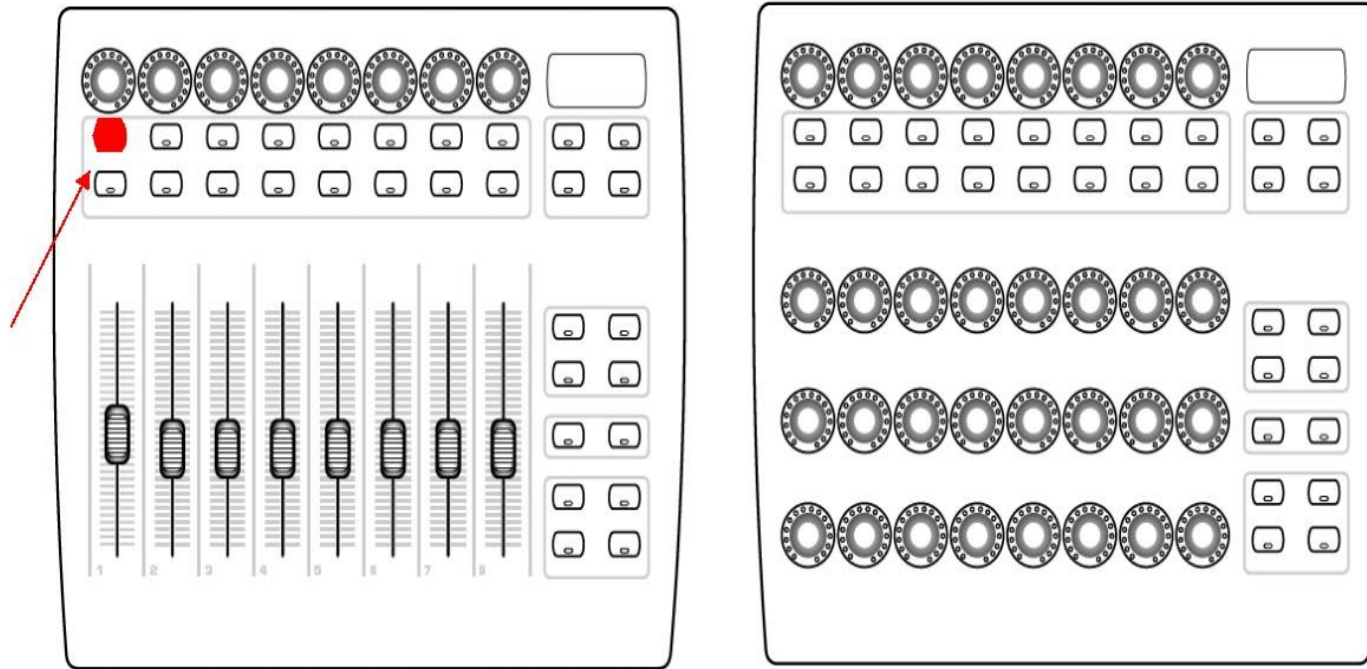
Controls



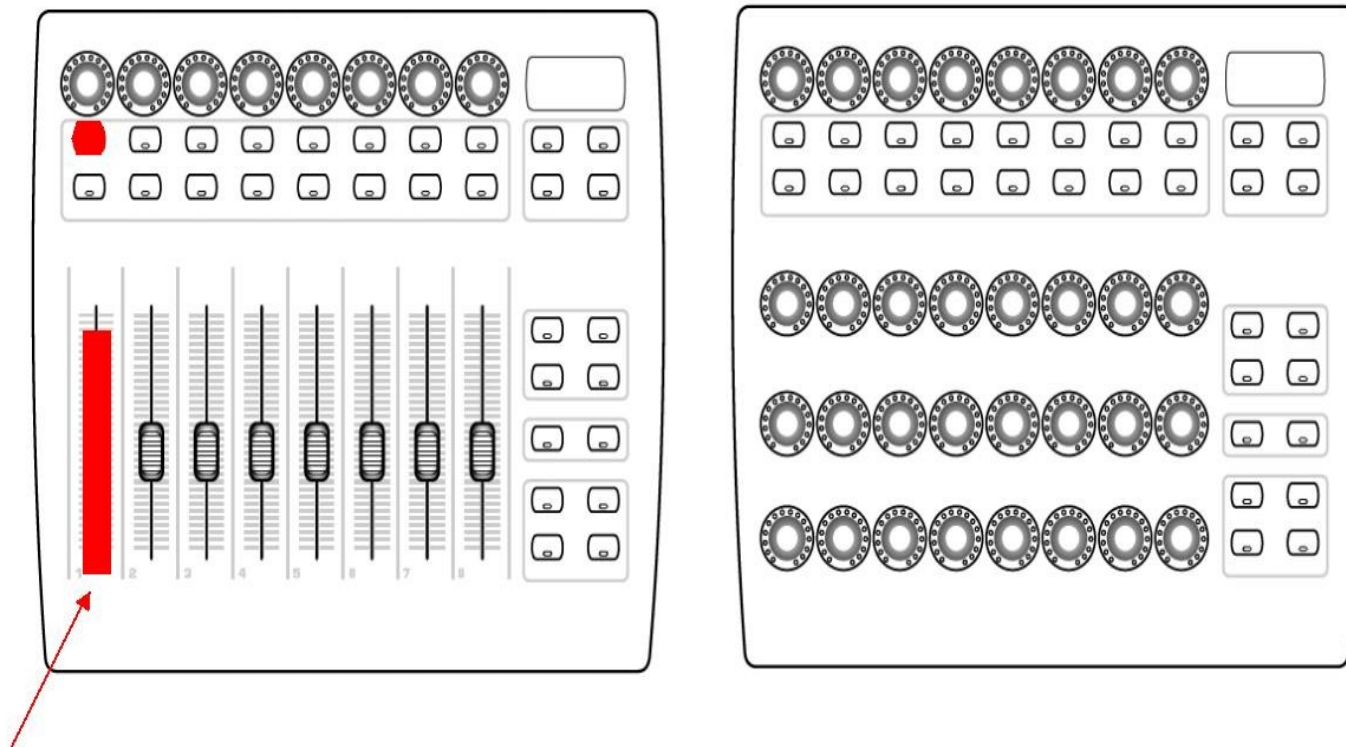
Example Scenario

- Task: Diffuse 8 channels
from : input source 1
to: ring of 8 speakers horizontal

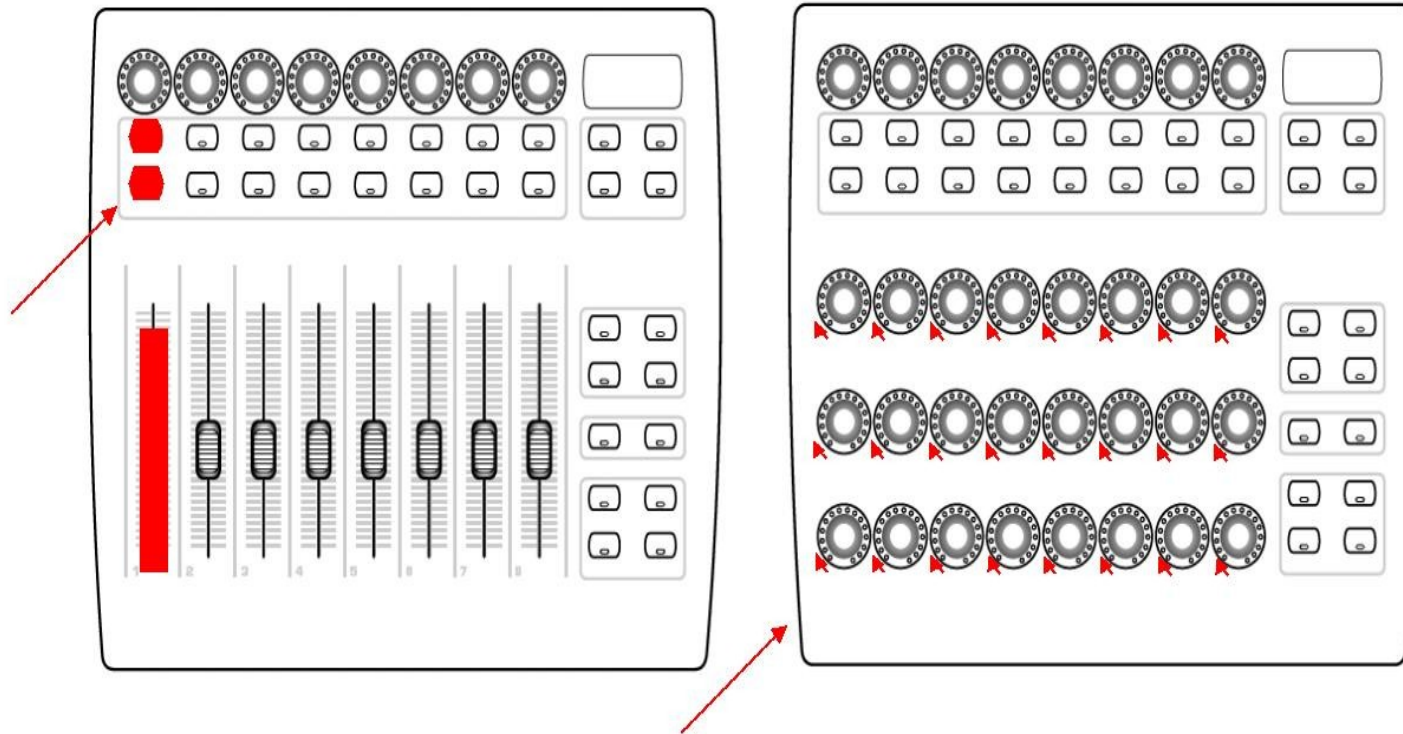
Diffuse to ring of 8



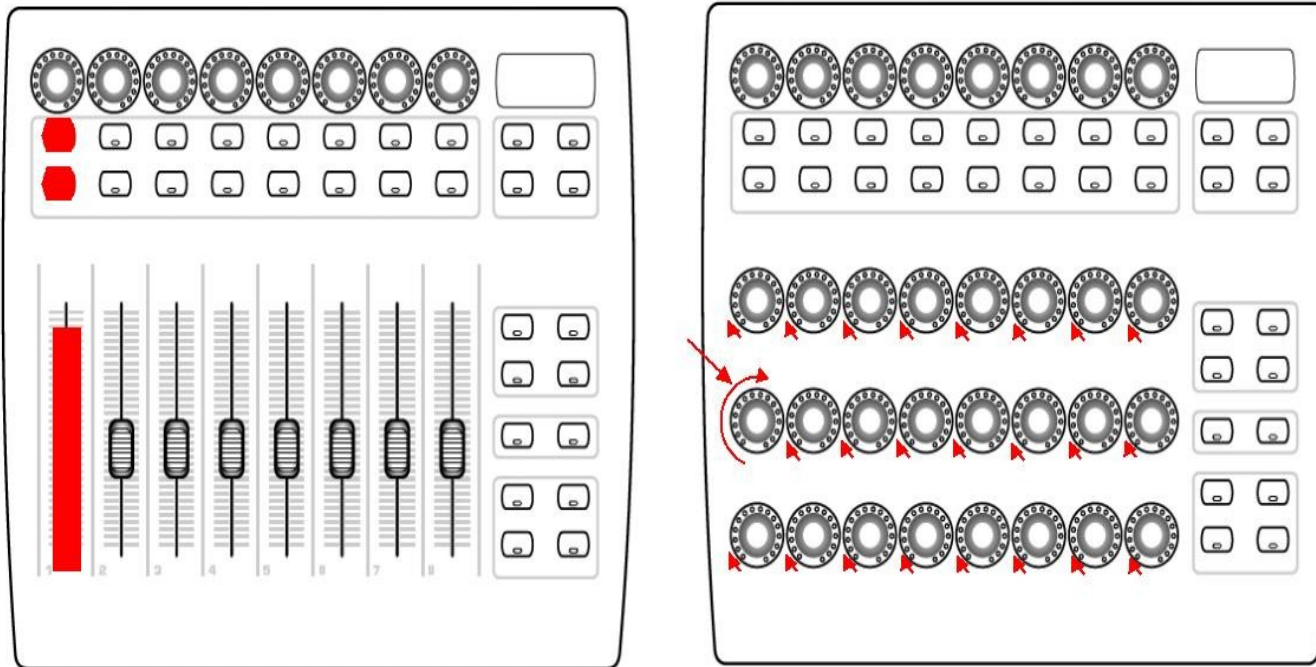
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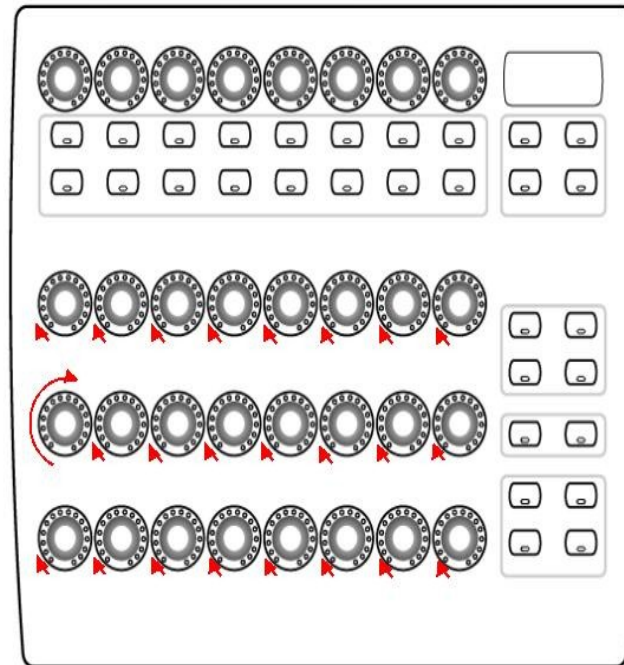
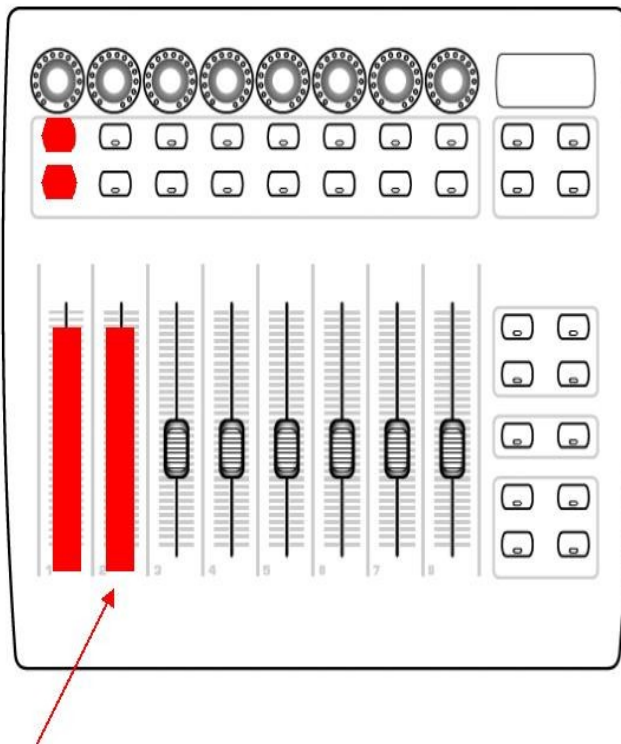
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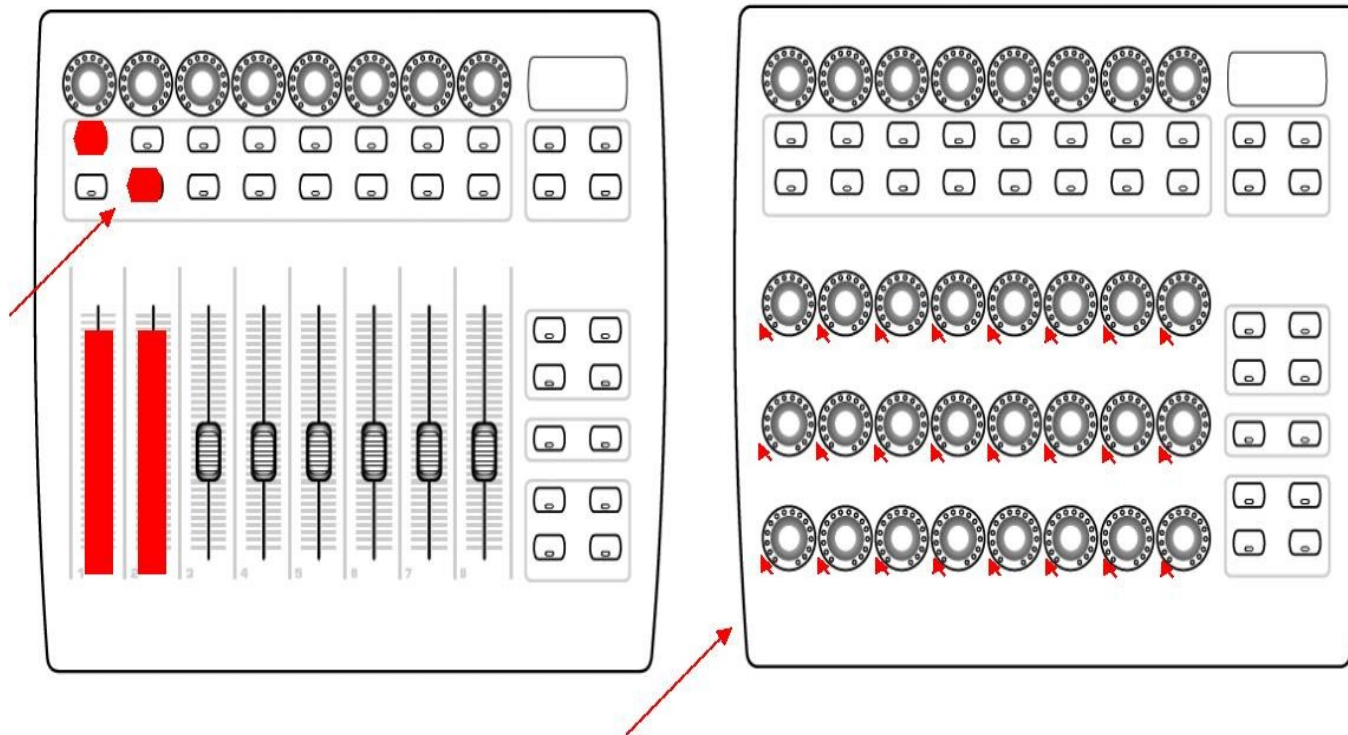
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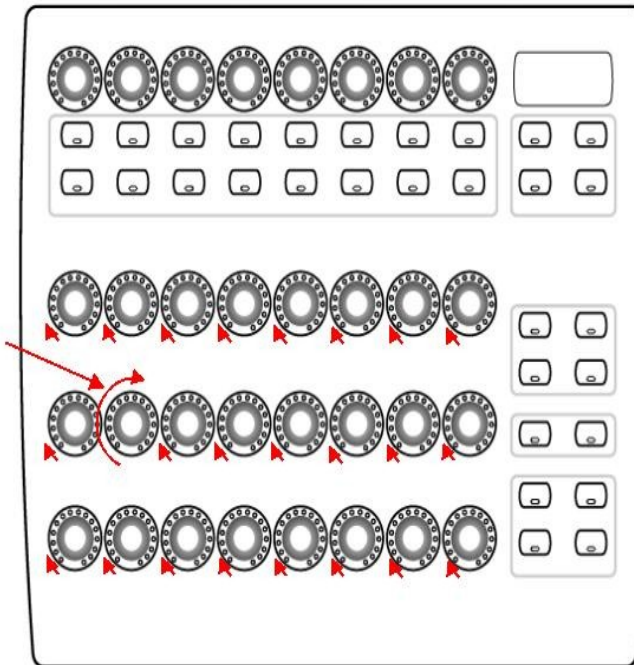
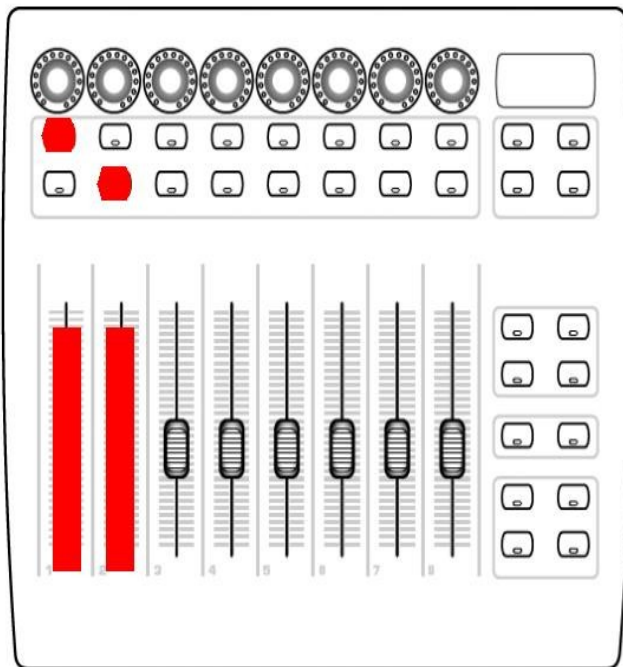
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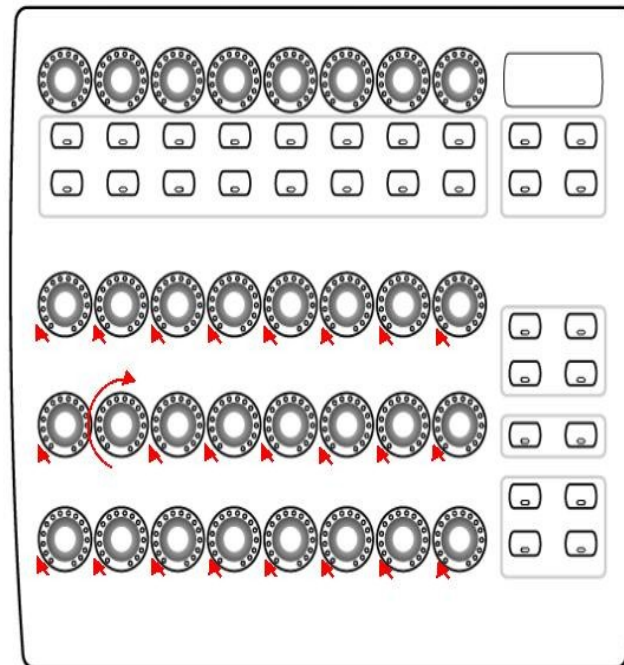
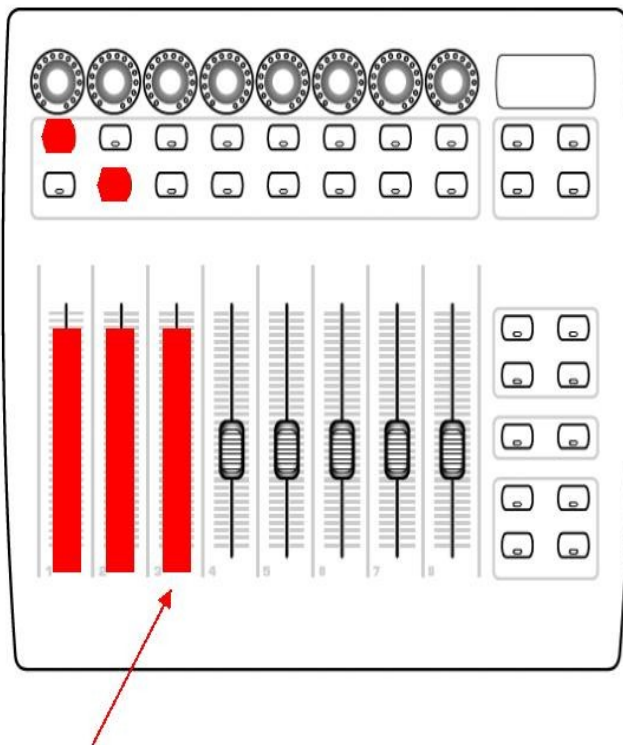
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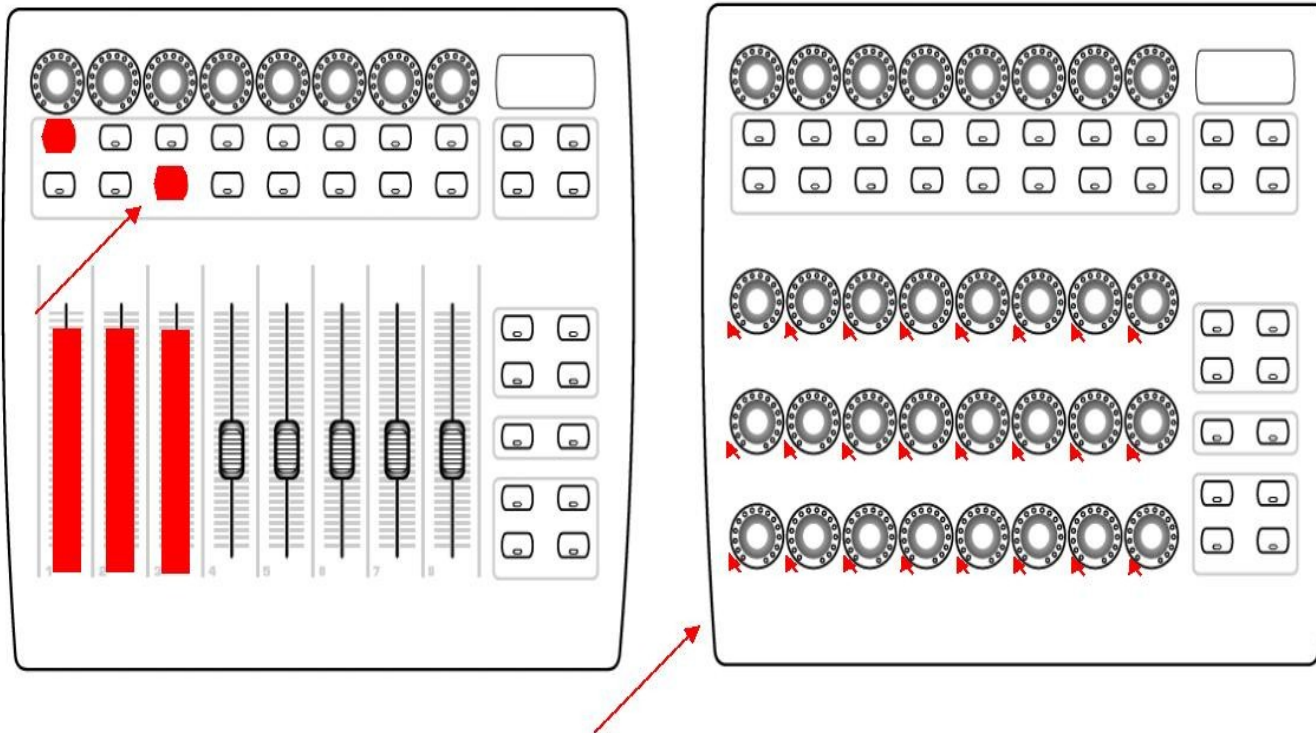
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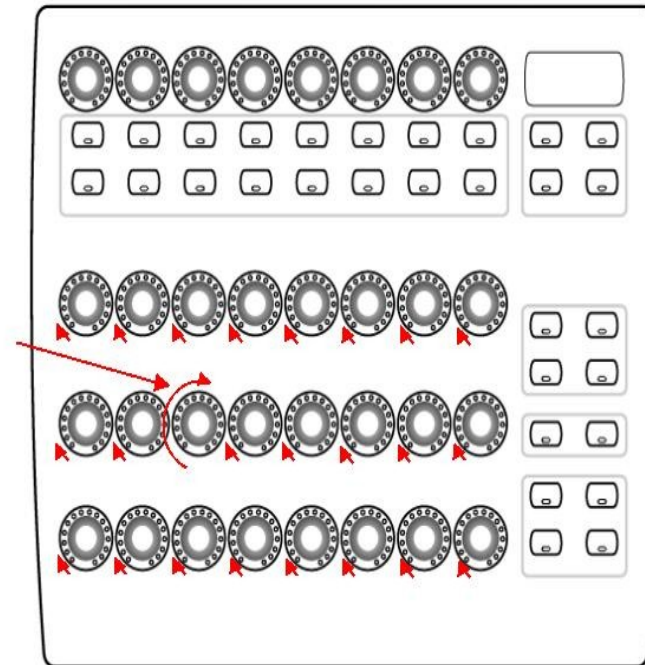
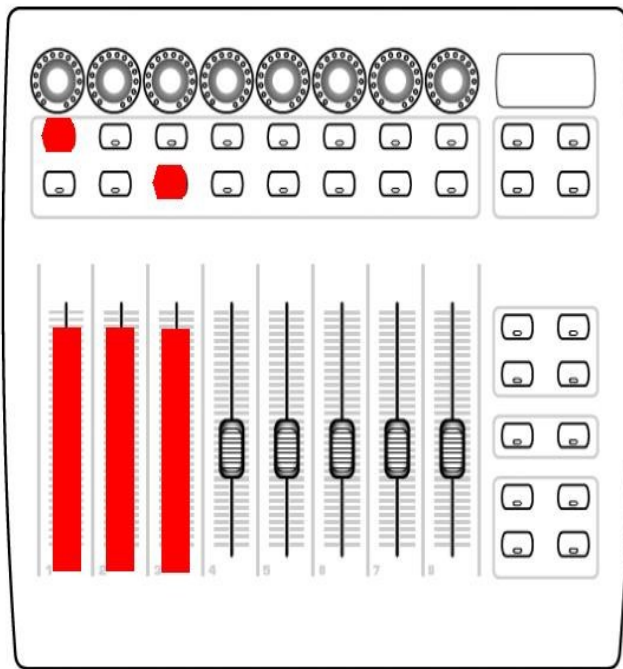
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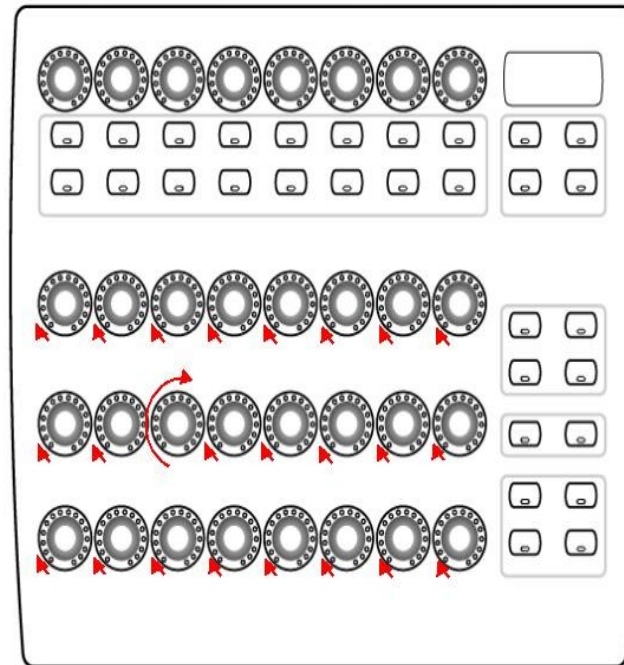
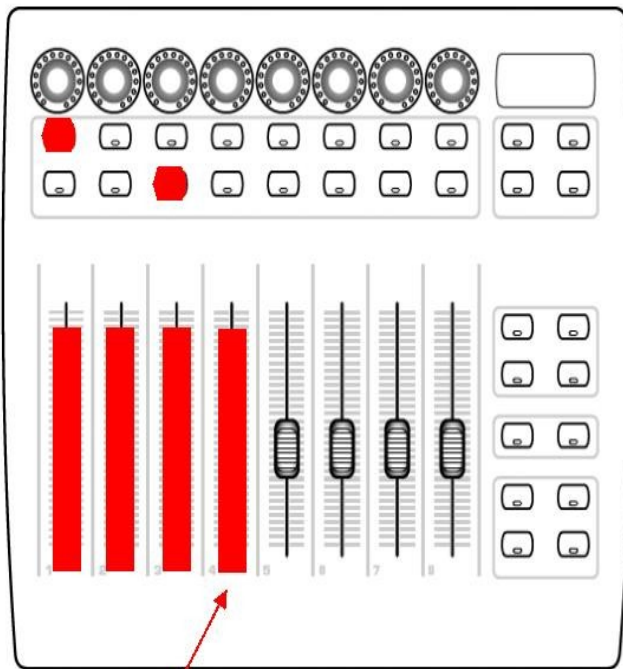
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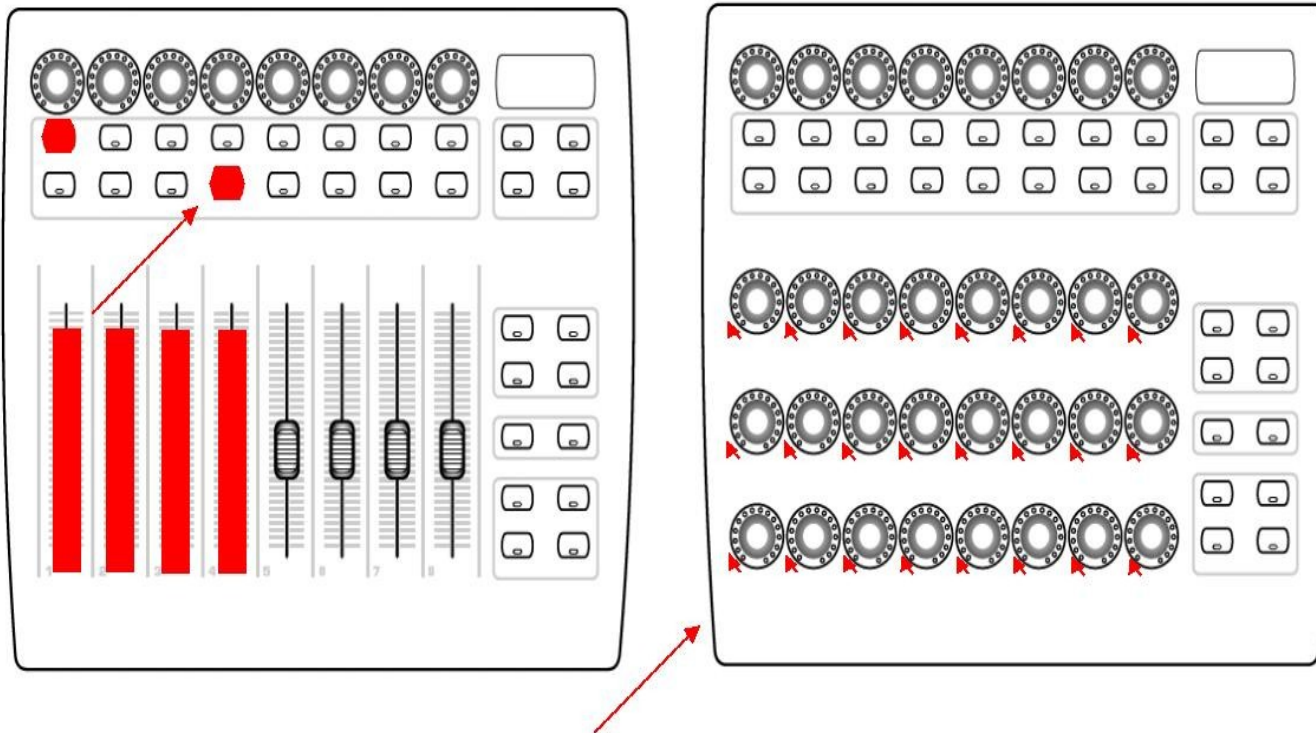
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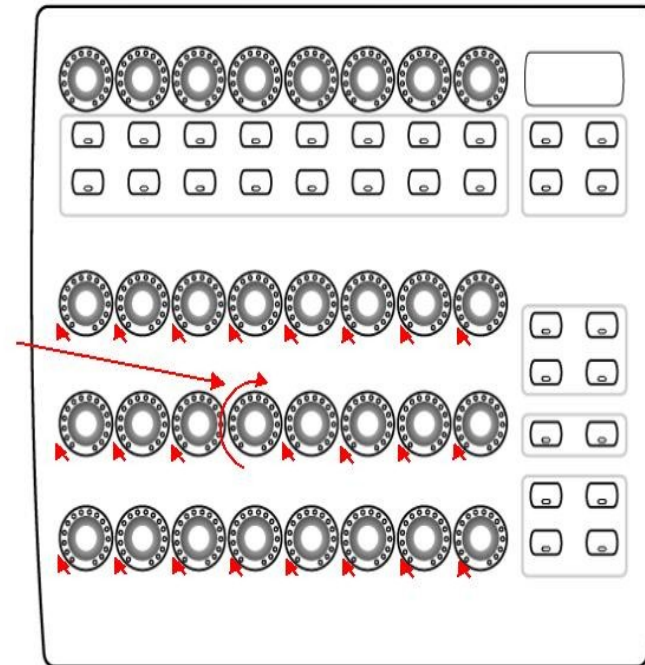
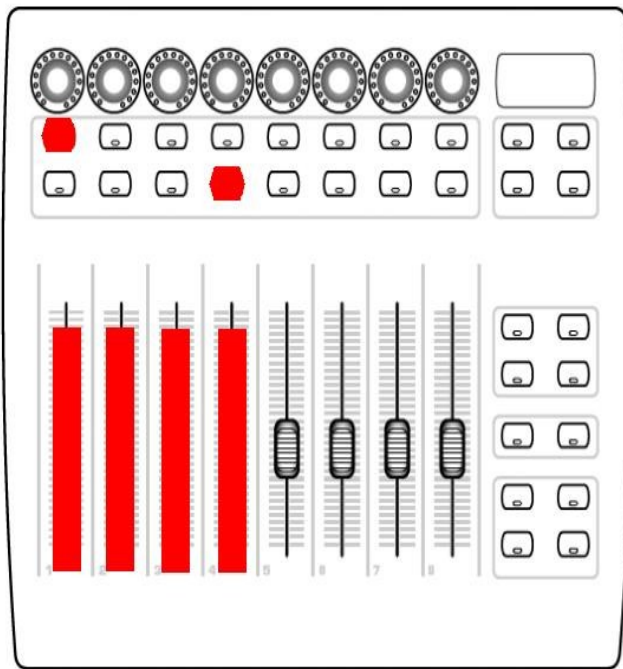
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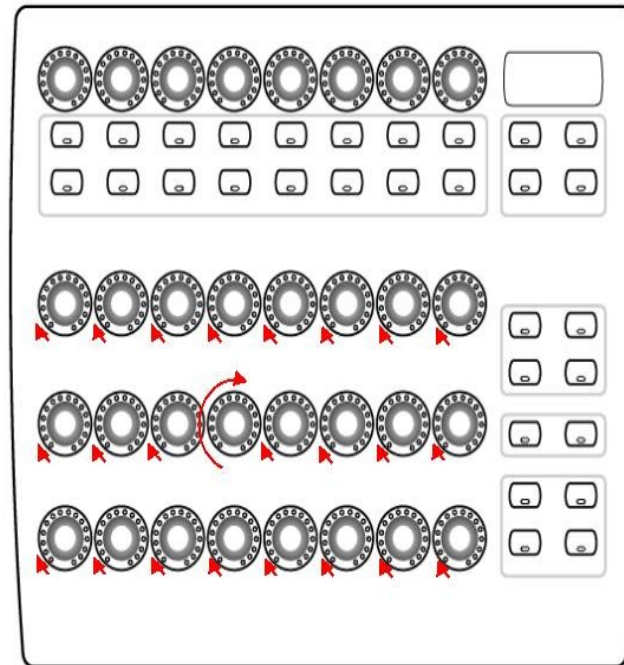
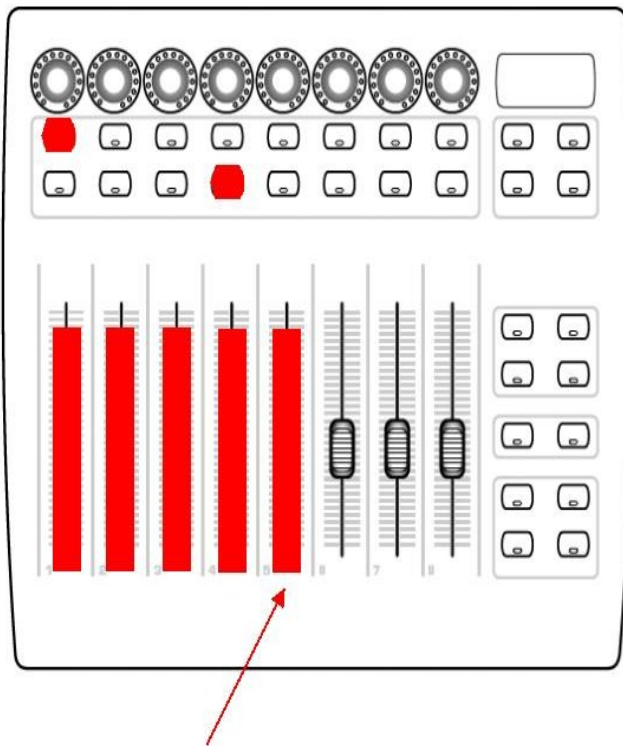
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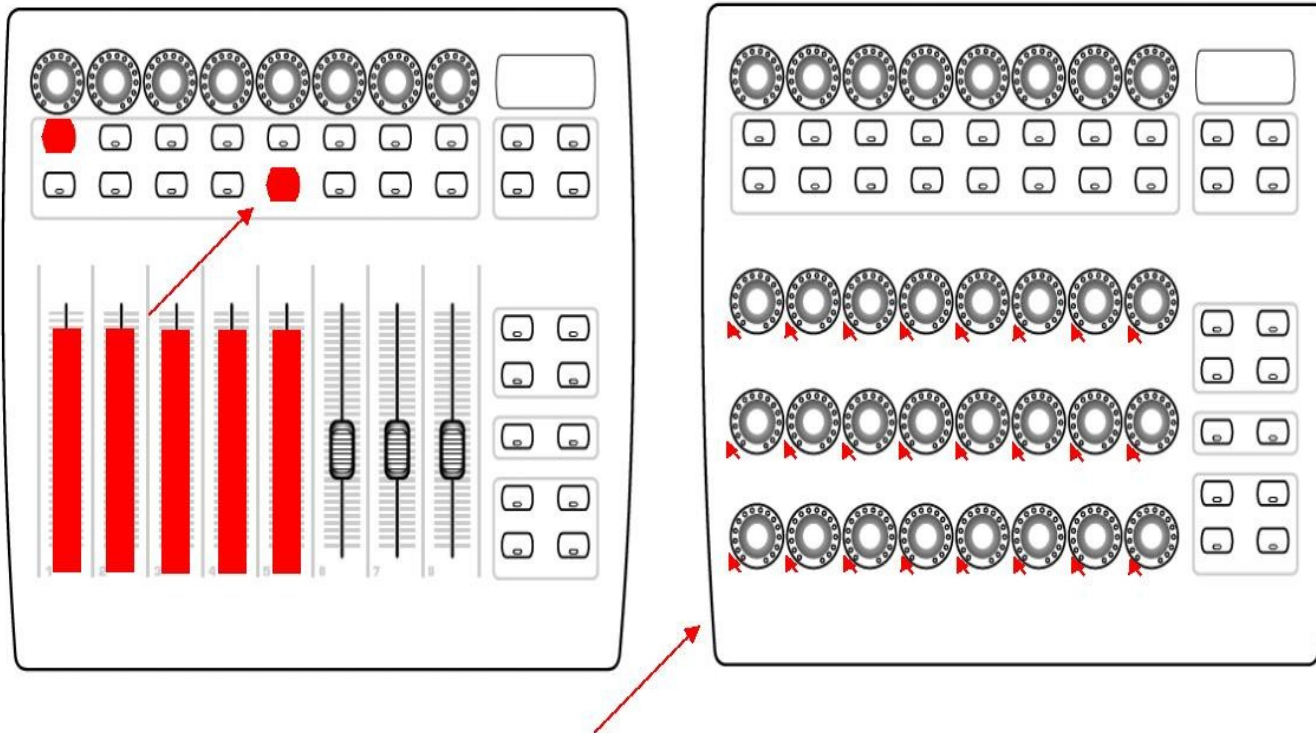
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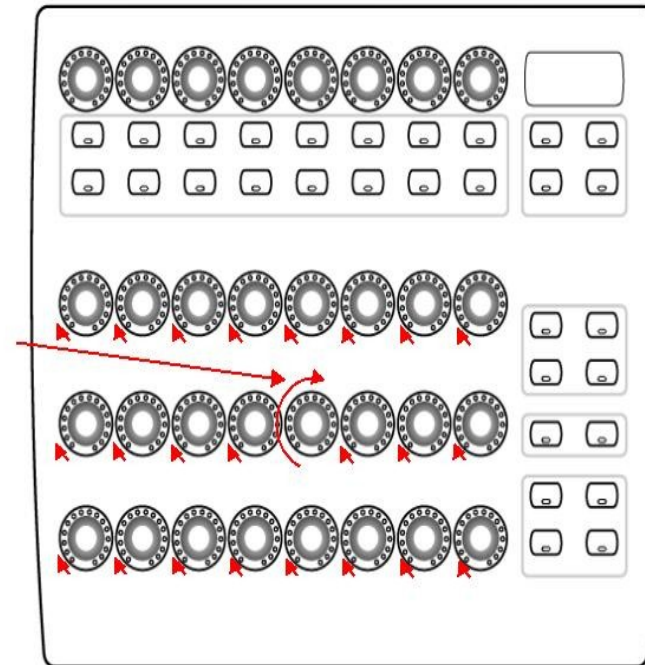
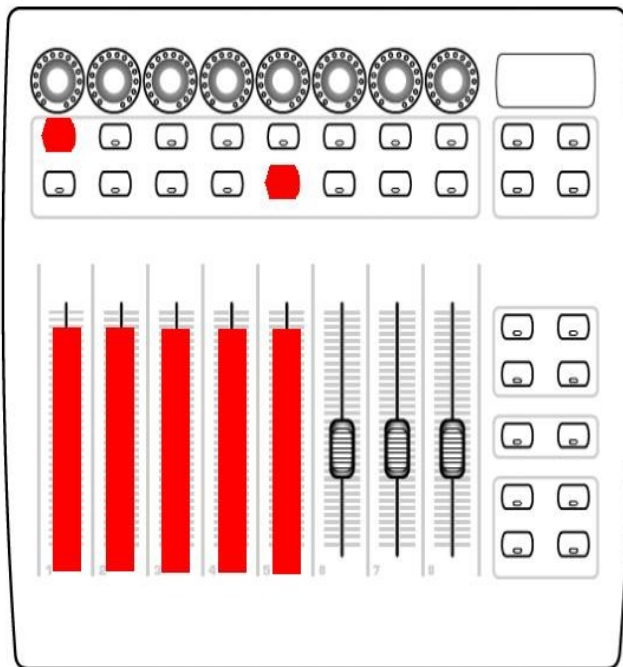
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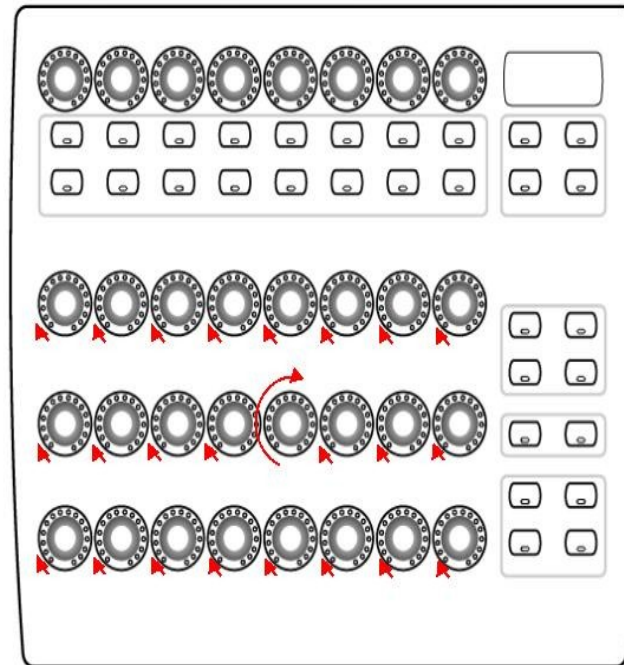
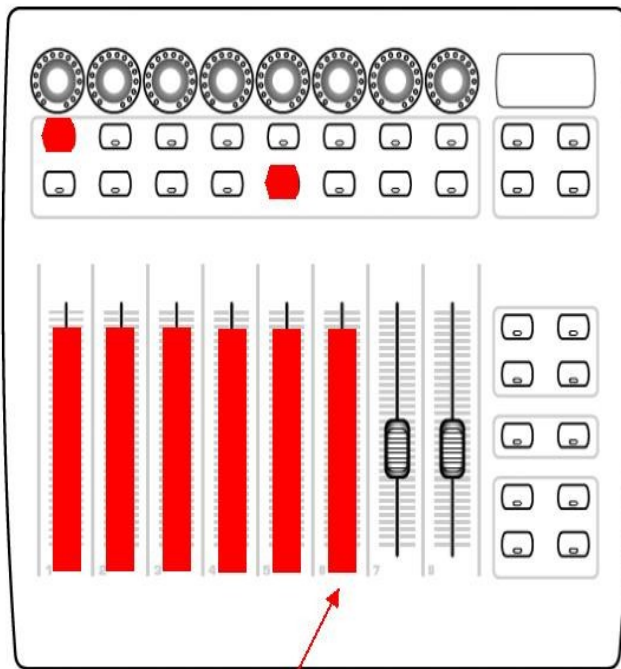
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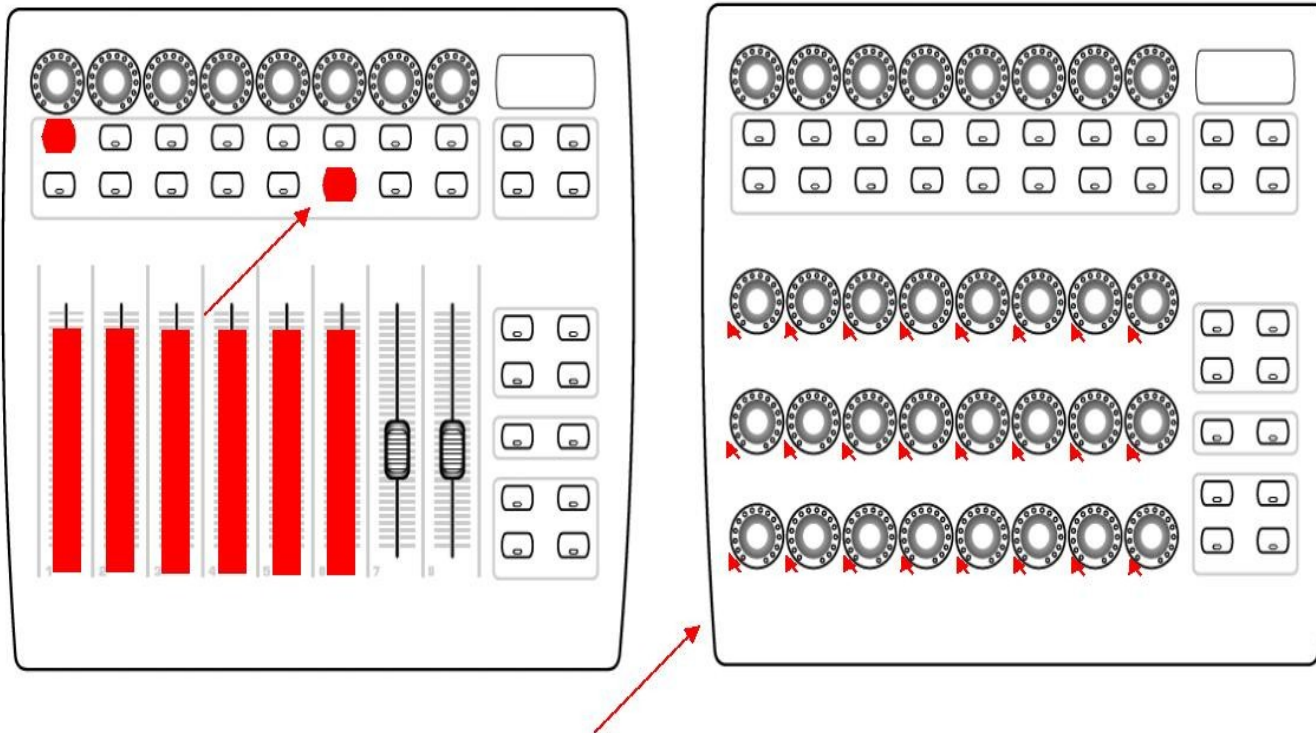
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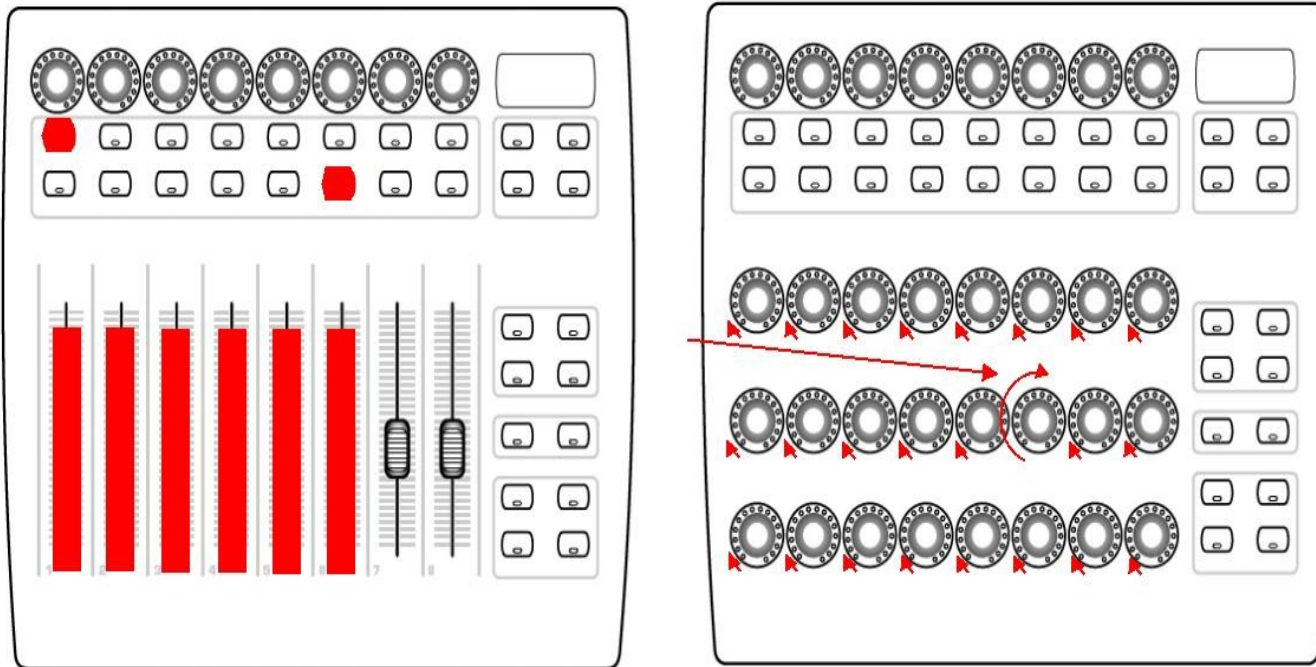
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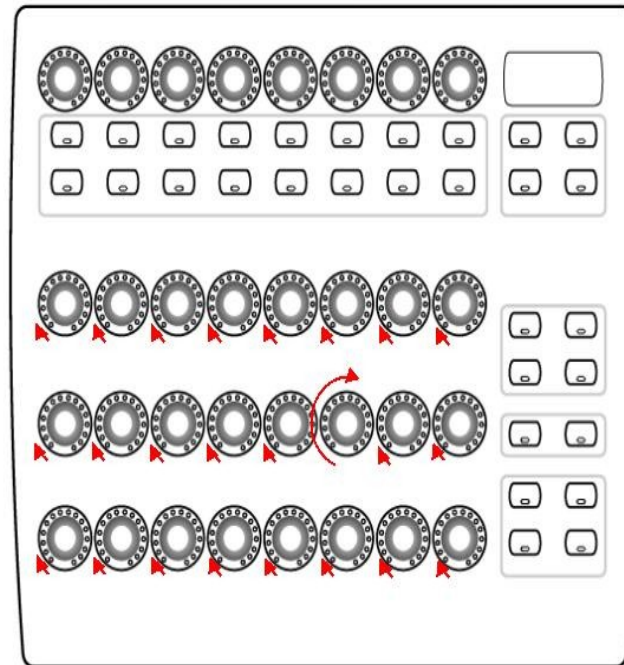
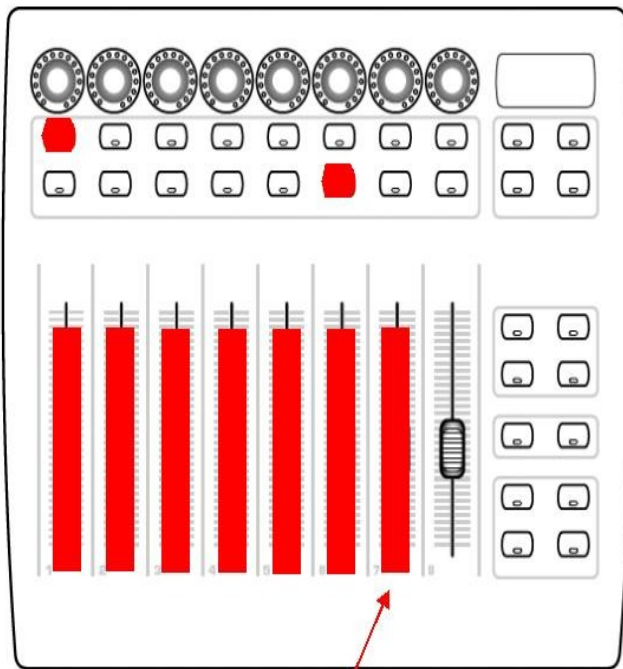
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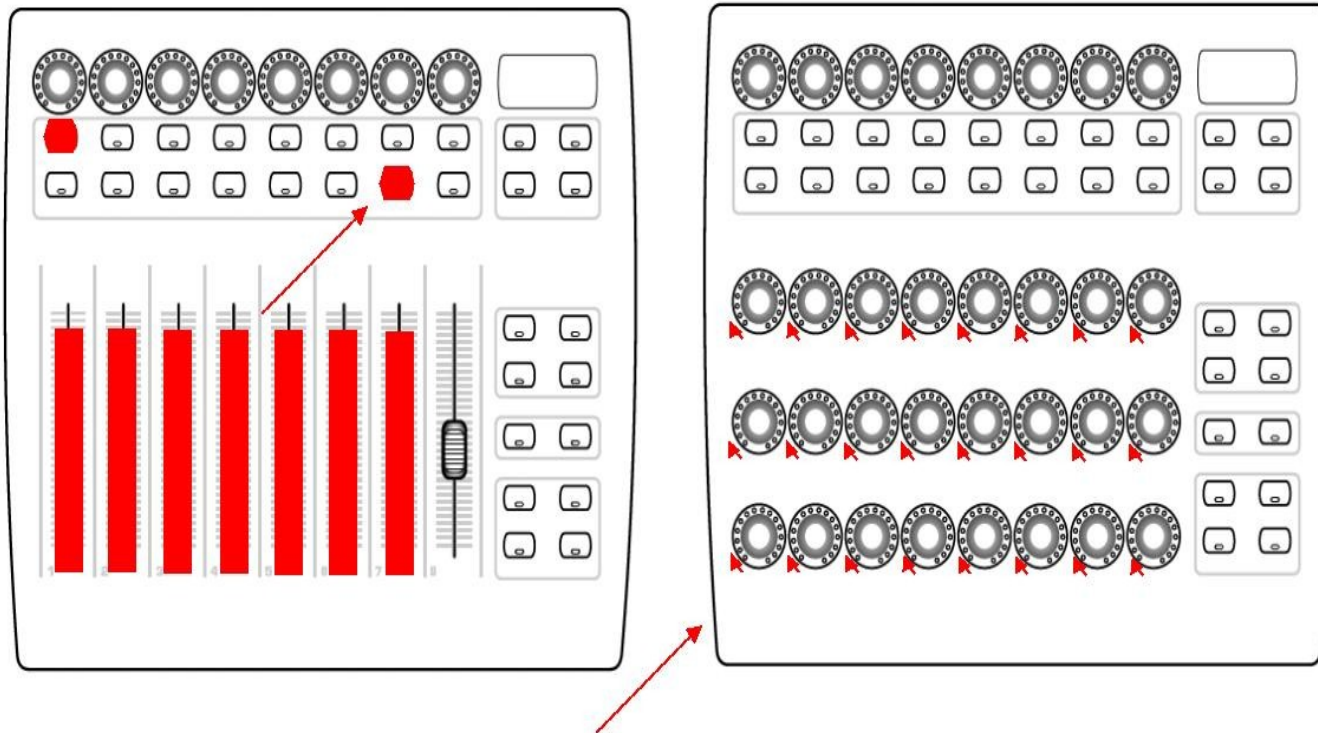
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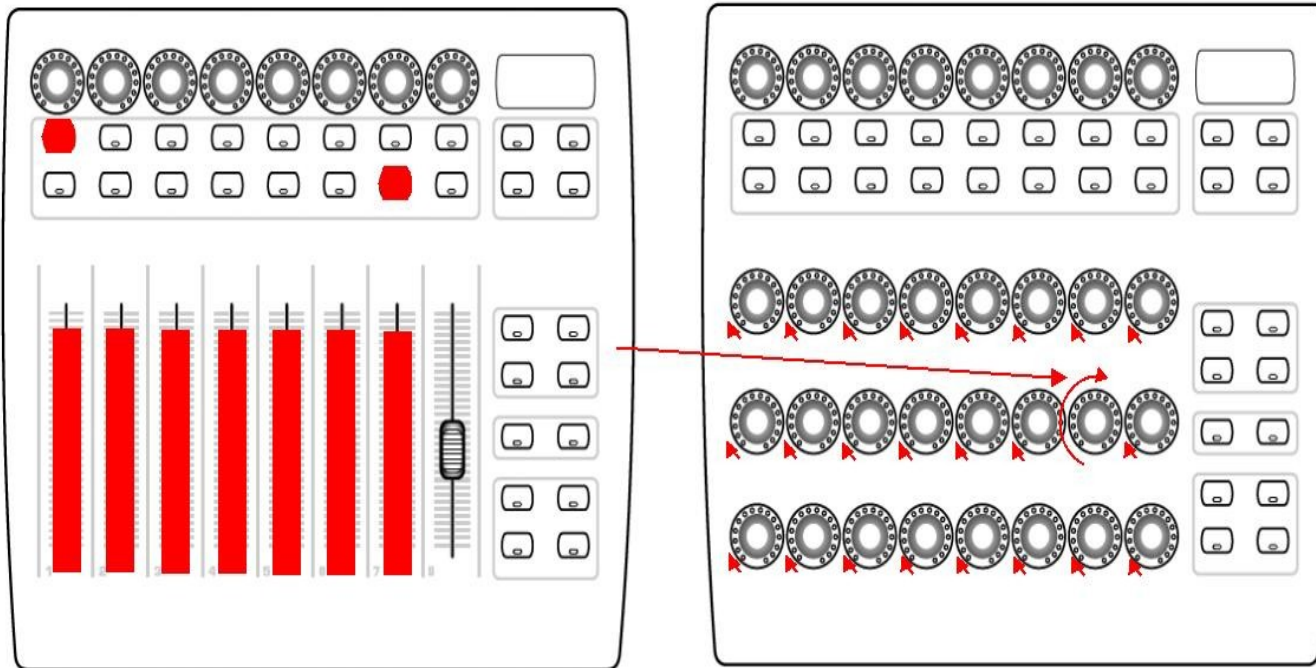
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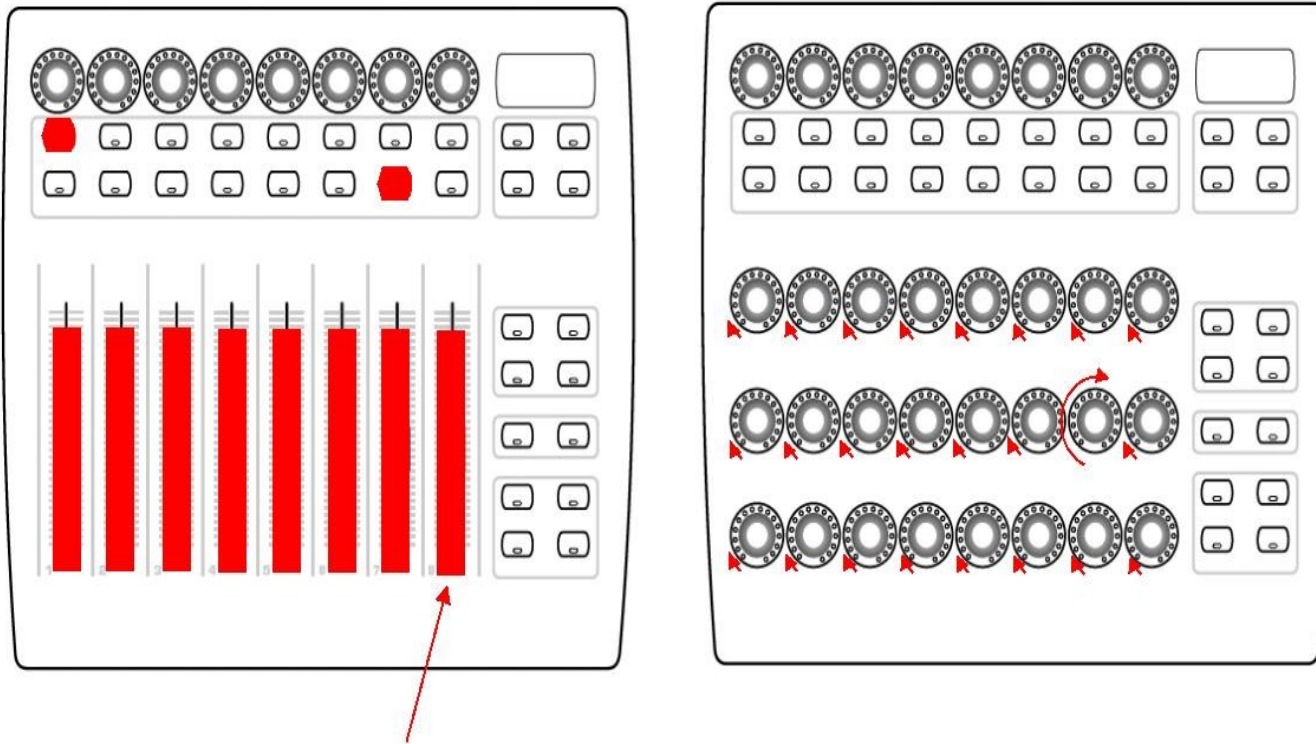
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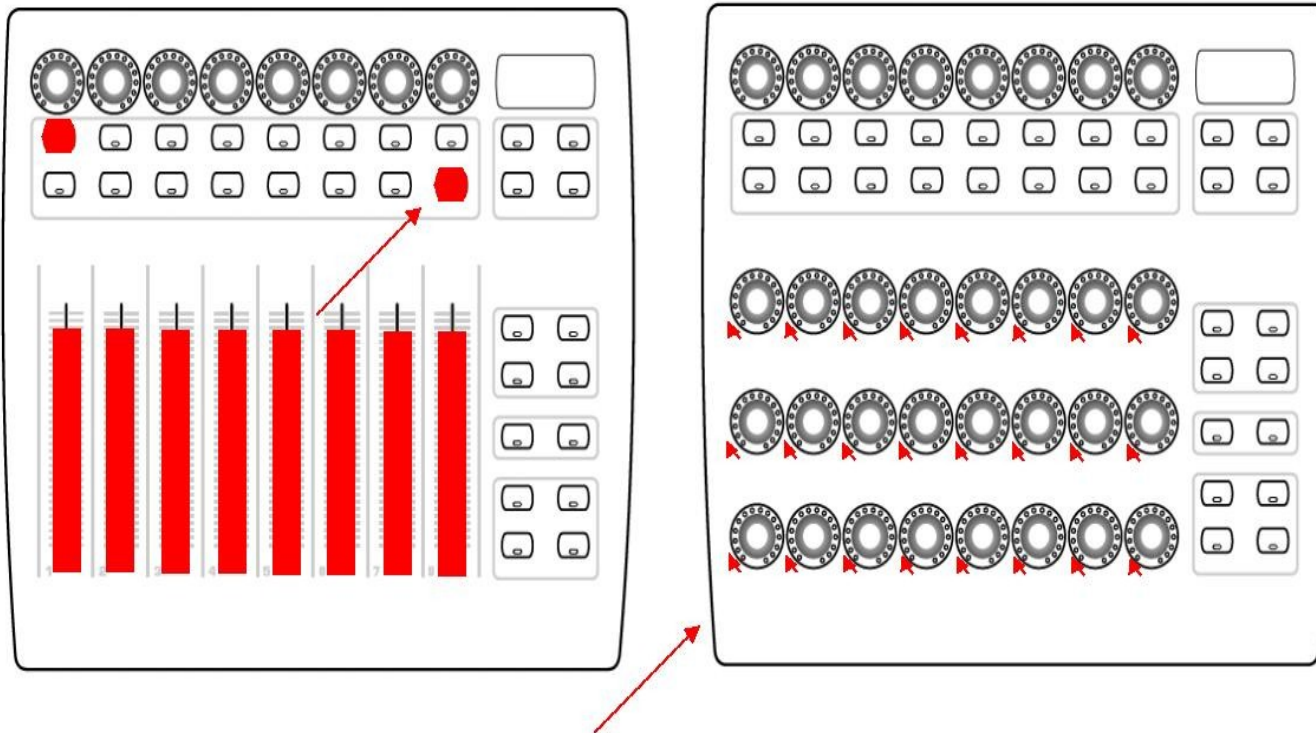
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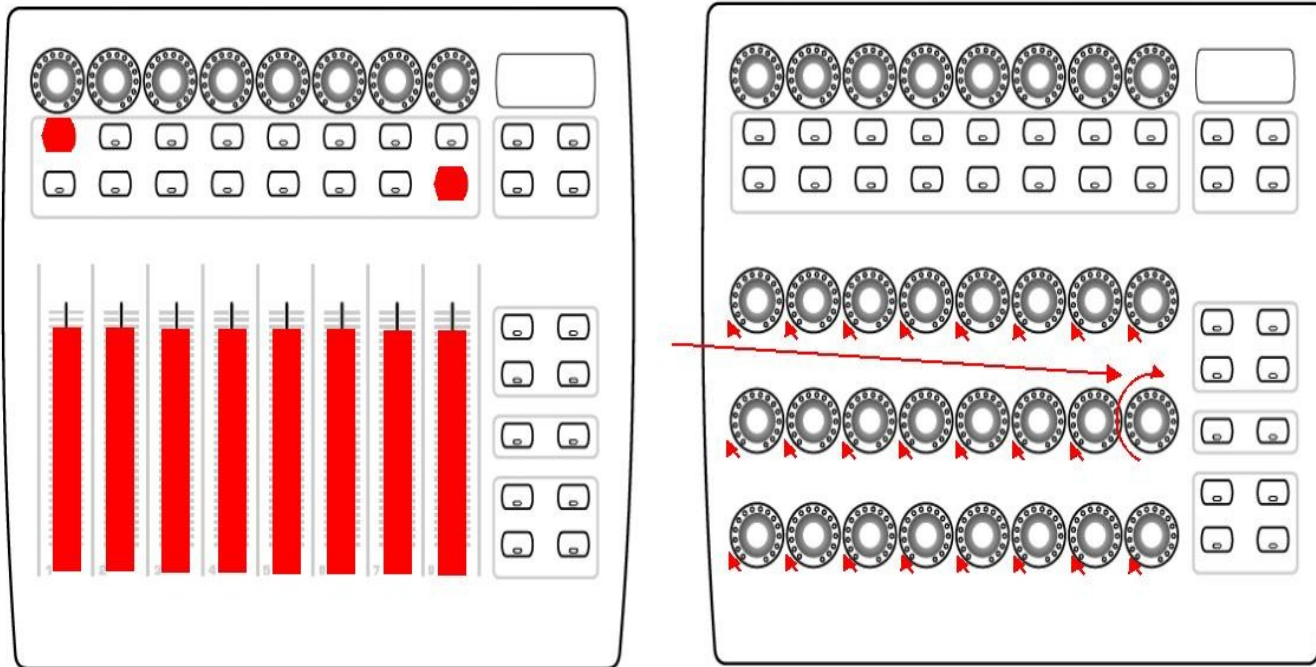
Diffuse to ring of 8



Diffuse to ring of 8



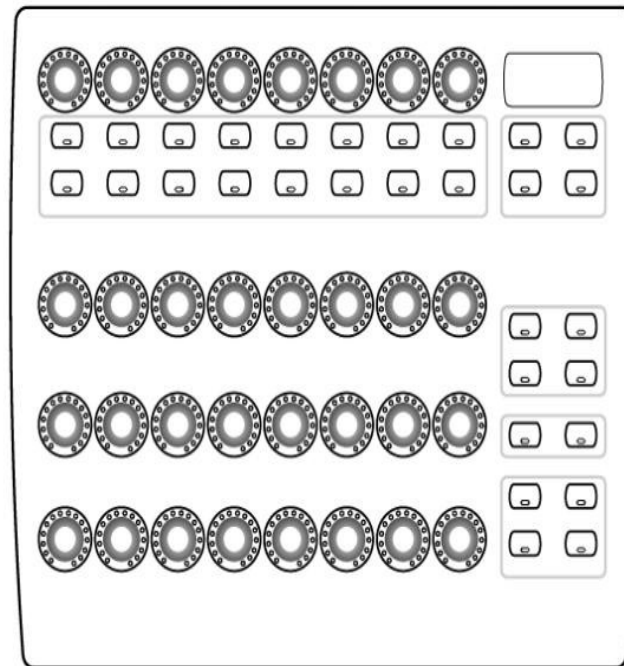
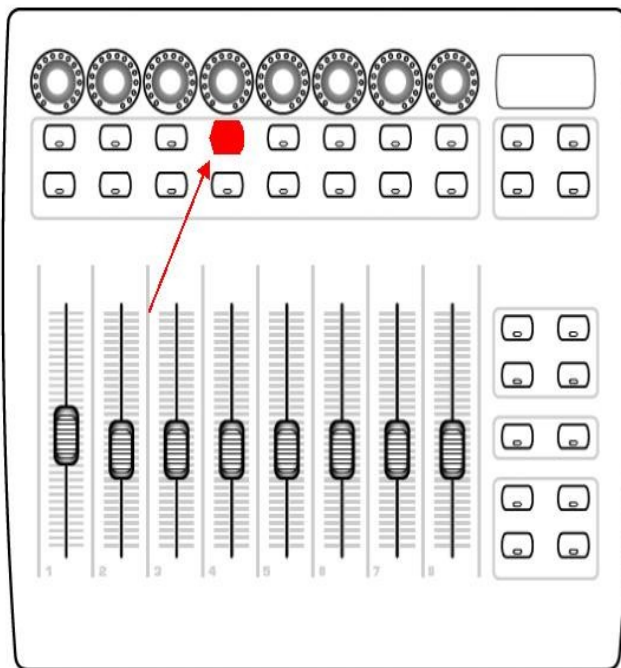
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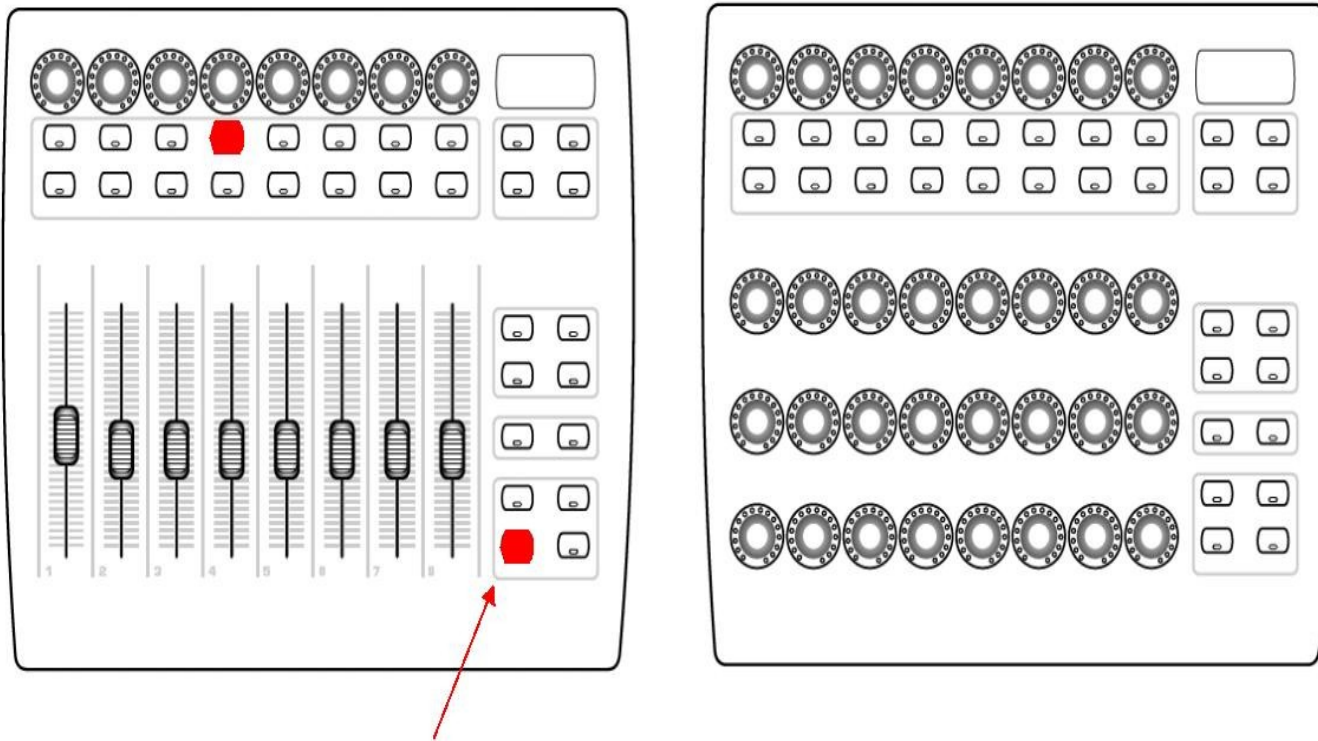
Example Scenario 2

- Task: Diffuse Encoded Ambisonics
from : input source 4
to: 16 ch Spherical speaker array

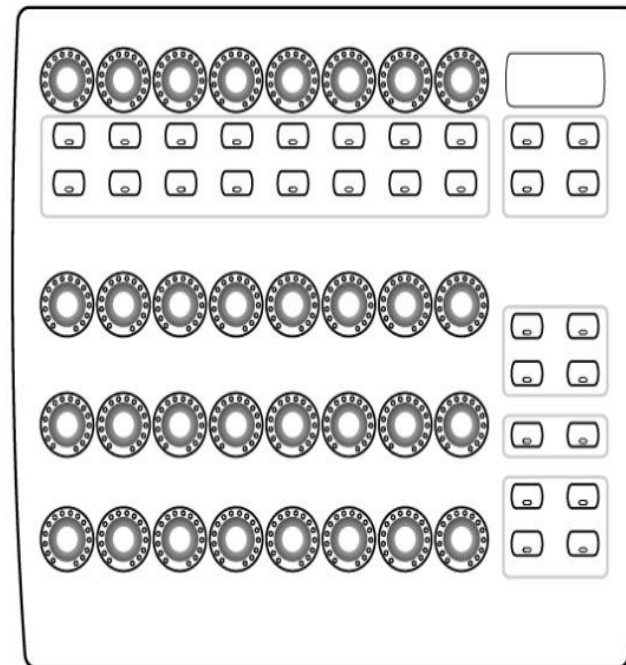
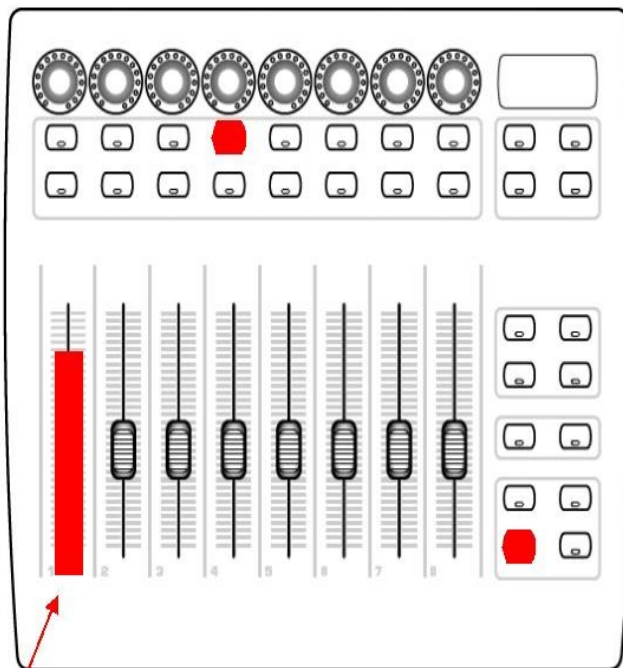
Diffuse Ambisonics Stream



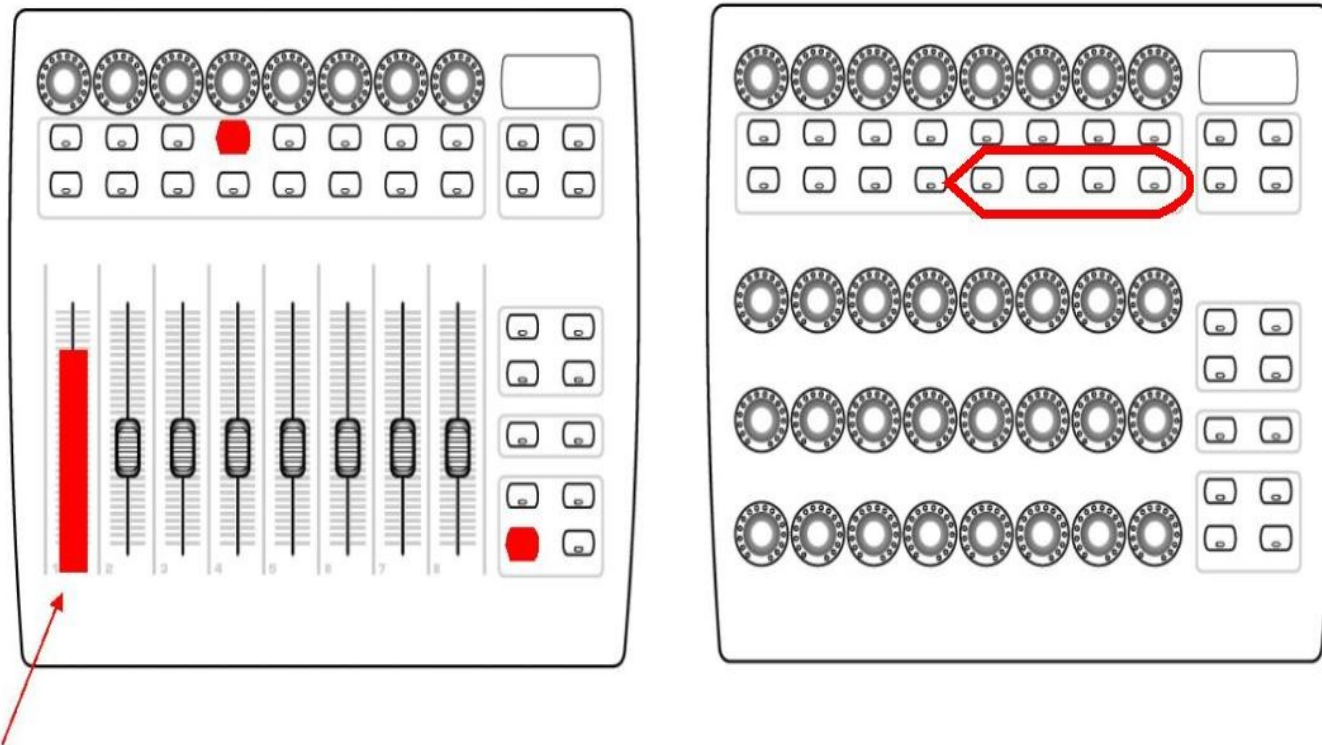
Diffuse Ambisonics Stream



Diffuse Ambisonics Stream



Diffuse Ambisonics Stream



Current state

- Dual sound cards not running on Openmixer
 - Raydat WC daughter card not working(linux)
- No Preset Authentication
 - Possibly create a webserver
- No All-in-one patchbay

Future works

- GUI for feedback of level metering
- Built-in Ambisonics encoding
 - Implemented but not released to Users

Where to get it

<https://ccrma.stanford.edu/software/openmixer>

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Acknowledgements

- Stephane Letz, Jack2,
 - <http://www.grame.fr/~letz/jackdmp.html>
- Fernando Lopez Lezcano, LAC2009,
 - “The Quest for Noiseless Computers”
- SuperCollider,
 - <http://www.audiosynth.com/>
 - <http://supercollider.sourceforge.net/>

Acknowledgements

- Fons Adriaensen, AmbDec
 - An Ambisonics Decoder
 - <http://www.kokkinizita.net/linuxaudio/>
- Fons Adriaensen, Jconvolver
 - A Convolution Engine
- The Soundwire Project
 - <https://ccrma.stanford.edu/groups/soundwire/>

Acknowledgements

- Jacktrip
 - <http://code.google.com/p/jacktrip/>
- Netjack
 - <http://netjack.sourceforge.net/>
- CCRMA Stanford, USA
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Thank You

